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Water structure analysis considering dielectric spectrum in microwave range

Arkhipov V., Gusev Y., Lounev I.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

In this paper the analysis of the water dielectric spectrum in the relaxation (1 cm) and microwave (100 mu) range on the basis of the theoretical results presented in Ref. was made. The absorption spectrum in the microwave range as well as the relaxation spectrum are shown to be the results of the orientational polarization. In the framework of the existing water structure models this result corresponds to the models in which one assume two types of the molecules for the fixed time moment. They are the molecules having a hydrogen bonds and ones free from them. Free molecules either can be located in the voids or can make the exchange between the clasters. In the analysis suggested we do not use the definite water structure model. The dielectric spectrum parameters allow us estimate the value of the abnormal water expansion within the freezing process. Our results agree well with the experimental data.